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from the group consisting of retroviral vectors, adenoviral vectors, and  
adeno-associated viral vectors; and

b) obtaining modified human hematopoietic stem cells.

23. (amended) A method for genetically modifying human hematopoietic stem cells, comprising:

a) contacting a vector comprising a polynucleotide sequence encoding a heterologous gene with a population of hematopoietic stem cells cultured with fibronectin and in the presence of an effective amount of a thrombopoietin ligand (TPO), a flt3 ligand (FL), and interleukin 6 (IL6) wherein the TPO, FL and IL6 are each provided in a concentration range of about 0.1 ng/mL to about 500 ng/mL, and wherein said vector is selected from the group consisting of retroviral vectors, adenoviral vectors, and adeno-associated viral vectors; and

b) obtaining modified human hematopoietic stem cells.

37. (amended) A method of transducing mammalian CD34<sup>+</sup> hematopoietic cells including a subpopulation of hematopoietic stem cells comprising:

a) obtaining a source of hematopoietic cells including the subpopulation of hematopoietic stem cells;  
b) culturing said cells with fibronectin and the cytokines TPO, FL and IL-6, individually provided in the range of about 0.1 ng/mL to about 500 ng/mL;  
c) infecting the cultured cells with a retroviral vector including a polynucleotide sequence encoding a heterologous gene; and  
d) obtaining transduced cells wherein said gene is expressed.